

## ABSTRACT

The object of the present invention is to provide a material excellent in field electron emission which can withstand the high intensity of electric field, allows the enhanced emission of electrons resulting in a high density of current, and does not degrade during long use.

The solving means consists of providing a membrane body of  $sp^3$ -bonded boron nitride excellent in field electron emission obtained by a method comprising the steps of introducing a reactive gas including a boron source and a nitrogen source into a reaction system; adjusting the temperature of a substrate in the reaction chamber to fall between room temperature to 1300°C; radiating a UV beam onto the substrate with or without the concomitant existence of plasma; and forming via vapor-phase reaction a membrane on the substrate in which a surface texture allowing excellent field electron emission is formed in a self-organized manner.